

Quality of Life in Older Women With Early-Stage Breast Cancer in the First Year of Survivorship

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Purpose/Objectives: To describe quality-of-life (QOL) changes in older women with early-stage breast cancer in the first year of survivorship and report on the effectiveness of a psychoeducational intervention on survivors' QOL.

Design: Secondary analysis, descriptive, repeated measure.

Setting: An academic setting in the southeastern United States.

Sample: 50 early-stage breast cancer survivors, aged 65 years and older.

Methods: Data were drawn from the Breast Cancer Education Intervention (BCEI) research study. Data for a six-month time period within the survivors' first year were available for an experimental group participating in a psychoeducational intervention and a control group.

Main Research Variables: Overall QOL and physical, psychological, social, and spiritual well-being subscales.

Findings: Older women reported positive overall QOL within the first year of survivorship, but overall QOL declined slightly over time. Physical and psychological well-being declined over time. Social well-being initially improved over time, but then declined. Spiritual well-being initially declined over time, then improved. Survivors had a downward trend in overall QOL during the study time period; however, experimental group participants had a smaller decline in QOL compared to control group participants.

Conclusions: QOL in older breast cancer survivors within the first year is positive. However, overall QOL declines over time. The BCEI attenuated decline of QOL in the experimental group compared to the control group.

Implications for Nursing: Few studies focus on older breast cancer survivors. This descriptive study is one of the first to describe changes in QOL and report the effect of interventions for older breast cancer survivors. Oncology nurses are in a position to recognize QOL issues and help older women maintain QOL in the first year of survivorship after treatment.

Key Points . . .

- ▶ Few research studies have focused on quality of life (QOL) in older women after treatment for early-stage breast cancer.
- ▶ Supportive interventions may slow the decline of QOL in older breast cancer survivors after treatment.
- ▶ Nurses should recognize that older women may experience declines in QOL after treatment despite interventions and education designed to improve QOL.

quality of life (QOL) (Boyle, 2006; Dow, 1991, 2003; Dow & Loerzel, 2005; Loescher, Welch-McCaffrey, Leigh, Hoffman, & Meyskens, 1989; Welch-McCaffrey, Hoffman, Leigh, Loescher, & Meyskens, 1989; Zebrack, 2000). Older women may experience other chronic illnesses in addition to breast cancer that may have an additional effect on QOL (Yancik & Ries, 2000).

Research demonstrates that women of different ages diagnosed with breast cancer have different concerns and needs (Cameron & Horsburgh, 1998; Wang, Cosby, Harris, & Liu, 1999). However, research on the needs of women with breast cancer who are aged 65 years and older and in the first year of survivorship is limited. The purpose of this article is to study QOL in older, early-stage breast cancer survivors in

Breast cancer is the most common cancer among women in the United States (American Cancer Society [ACS], 2008), and more than 2.3 million women are breast cancer survivors (ACS, 2007). The mean age of all women diagnosed with breast cancer is 61 years, and women aged 75–79 years have the highest incidence of the disease (ACS, 2007). As the baby boomer generation ages with increased life expectancy, the number of older women (aged 65 and older) diagnosed with breast cancer also is expected to increase (U.S. Census Bureau, 2005).

Older women with breast cancer receive standard treatments such as mastectomy, lumpectomy, radiation, chemotherapy, and hormone therapy (Chagpar et al., 2006; Du, Jones, & Zhang, 2005; Leonard & Malinowsky, 2005; Muss et al., 2005). Older breast cancer survivors are at risk for adverse effects from these treatments that may have an effect on

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the first year of survivorship. The primary aim is to describe changes that occur over time in overall QOL and subscales of physical, psychological, social, and spiritual well-being. A secondary aim is to examine the effects of the Breast Cancer Education Intervention (BCEI) psychoeducational support intervention on QOL outcomes among older women with breast cancer.

Literature Review

Data show that cancer and its treatment affect QOL in breast cancer survivors; however, the effect on QOL in older women is unclear. Many studies that examine QOL report the average age of their participants as 50 years (Dow, Ferrell, Haberman, & Eaton, 1999; Ferrell, Dow, & Grant, 1995; Ferrell, Dow, Leigh, Ly, & Gulasekaram, 1995; Ferrell et al., 1996; Holmberg, Scott, Alexy, & Fife, 2001; Manning-Walsh, 2005; Padilla, Ferrell, Grant, & Rhiner, 1990; Pinto & Trunzo, 2004; Rustoen, Moum, Wiklund, & Hanestad, 1999; Wenzel et al., 1999). Exclusion or lack of participation of older women in clinical trials has led to a knowledge deficit regarding older women with breast cancer. Because of the paucity of research with older breast cancer survivors, the authors reviewed relevant older studies that aid in understanding current knowledge regarding this population.

Several studies have focused on QOL outcomes in older women after surgical treatment for early-stage breast cancer. The studies indicate that older women who receive conservative treatments, such as lumpectomy, experience fewer arm issues (de Haes, Curran, Aaronson, & Fentiman, 2003; Mandelblatt et al., 2002, 2003), fewer concerns with body image (de Haes et al.; Figueiredo, Cullen, Hwang, Rowland, & Mandelblatt, 2004), and better mental health (de Haes et al.) compared to women who receive mastectomy and axillary lymph node dissection. In addition, older women reported better mental health when they felt involved in making their treatment decisions (Mandelblatt et al., 2003).

Other studies have focused on physical outcomes in older women after treatment for early-stage breast cancer. Physical effects, such as fatigue (de Haes et al., 2003; Heidrich, Egan, Hengudomsb, & Randolph, 2006); arm issues related to axillary dissection such as lymphedema, swelling, and numbness (Mandelblatt et al., 2003); pain (Heidrich, 1996); concerns with physical function (Satariano, Ragheb, Buck, Swanson, & Branch, 1989); weight gain; constipation; dry mouth; weakness; and hot flashes (Heidrich et al.), have been reported by older women. Older women report more physical symptoms compared to younger women (Cimprich, Ronis, & Martinez-Ramos, 2002); however, when compared to women their own age with chronic illnesses other than breast cancer, older women with breast cancer report similar symptoms (Heidrich et al.). In addition, older women with breast cancer report being less bothered by symptoms than women with other chronic illnesses, such as arthritis (Heidrich).

Declines in physical well-being and function also have been reported by older women. The declines in well-being and function are more severe in older women compared to younger women (Cimprich et al., 2002; Fehlaue, Tribius, Mehnert, & Rades, 2005) but similar to declines experienced by older women without a history of breast cancer (Kroenke et al., 2004; Satariano et al., 1989).

Psychological effects reported by older women include concerns with emotional function (Satariano et al., 1989), fear of recurrence, lack of social support (de Haes et al., 2003), body image concerns (de Haes et al.; Figueiredo et al., 2004), and cognitive changes (Cimprich, 1998; Heidrich et al., 2006). All of these effects may have an impact on QOL outcomes in older women with early-stage breast cancer. However, older women have reported experiencing less distress at diagnosis and during treatment compared to younger women with breast cancer (Cimprich et al., 2002).

Socially, when compared to younger women, older women report fewer concerns with sexuality, employment, family distress (Cimprich et al., 2002), and finances (Fehlaue et al., 2005). Cognitive changes and deficits in concentration are more prominent in older women (Cimprich & Ronis, 2001).

Benefits related to religion and spirituality have been reported in older women with breast cancer. Older women have felt that religion and faith gave them support, comfort, and a feeling of connectedness (Feher & Maly, 1999). Faith also has helped older women cope and make meaning of their illness (Feher & Maly).

Conflicting information exists concerning the ability of older women to note positive changes in their lives after breast cancer. Utley (1999) reported that older women are able to see the benefits from cancer; however, Cimprich (1998) reported that older women note fewer positive changes from their breast cancer diagnoses compared to younger women.

Theoretical Framework

The conceptual model of **Quality of Life in Aging Breast Cancer Survivors (QOL-ABCS)** was used to frame the present study (see Figure 1). The QOL-ABCS was intuitively developed, is based on the experience of the investigator, and includes the subscales of physical, psychological, social, and spiritual well-being from the Quality of Life–Breast Cancer Survivors conceptual framework (Ferrell, Dow, & Grant, 1995; Ferrell, Grant, Funk, Otis-Green, & Garcia, 1997, 1998). However, the QOL-ABCS does not include the concepts within each subscale of well-being because the concepts that concern older women with breast cancer are unclear. The QOL-ABCS acknowledges that QOL in survivorship is influenced by more than health-related factors (e.g., issues

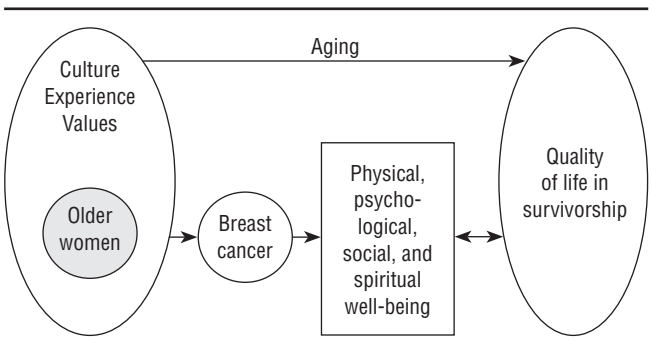


Figure 1. Conceptual Model of Quality of Life in Aging Breast Cancer Survivors

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Table 1. Demographic Characteristics

Characteristic	\bar{X}	Range
Age (years)	72.1	65–83
Characteristic	n	%
Months since diagnosis		
≤ 6	18	36
≥ 7	32	64
Race		
African American	3	6
Caucasian	41	82
Hispanic	4	8
Native American	2	4
Educational level		
Grade school	2	4
High school	20	40
Trade school	6	12
College	20	40
Graduate school	2	4
Religious preference		
Catholic	6	12
Christian	43	86
Jewish	1	2
Marital status		
Married	28	56
Divorced	5	10
Widowed	17	34
Lives alone		
Yes	17	34
No	33	66
Employment status		
Full-time	4	8
Part-time	6	12
Retired or homemaker	40	80
Income (\$)		
≤ 30,000	21	42
≥ 30,001	22	44
Did not respond	7	14
Disease stage		
I	35	70
II	15	30
Surgery type		
Lumpectomy	36	72
Mastectomy	12	24
Bilateral mastectomy	2	4
Chemotherapy		
Yes	9	18
No	41	82
Radiation therapy		
Yes	39	78
No	11	22
Hormonal therapy		
Yes	42	84
No	8	16

N = 50

related to aging). The QOL-ABCS accounts for these factors by signifying the potential influence of well-being and age on QOL in survivorship.

The QOL-ABCS uses the World Health Organization (1993) definition of QOL as “an individual’s perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, standards,

and concerns” (p. 153) to provide a holistic view of QOL. This model maintains that QOL is multidimensional, subjective, and dynamic; that the subscales of QOL are interactive with each other and one concept within a subscale often influences another subscale; that the experience and issues associated with aging influence older women’s perceptions of QOL in survivorship; that older women’s perceptions of their physical, psychological, social, and spiritual well-being after treatment influence QOL in survivorship; and that the perception of QOL influences well-being in survivorship, meaning that perceptions of overall QOL also can influence how older women perceive their well-being related to treatment.

Methods

Research Design

This study used a longitudinal repeated-measures approach. Data were drawn from the BCEI study, which was a longitudinal intervention trial that examined the effect of a psychoeducational support intervention for early-stage breast cancer survivors. Subjects were randomized to an experimental group or a control group. The experimental group received the BCEI psychoeducational support intervention over a six-month period. The intervention included three education and support sessions followed by five support sessions that were either conducted in person or via the telephone. Subjects in the control group received five attention control sessions conducted in person or via the telephone. The study is detailed in Meneses et al. (2007).

Sample

Subjects for the current study were 50 women, aged 65 years and older, who participated in the BCEI. Criteria for participating included being female, having completed treatment for histologically confirmed stage I–II breast cancer, being within the first year after treatment completion, and being able to communicate in English. Some subjects were on hormonal or anti-HER2/neu therapy at the time of study entry. Women with advanced or metastatic disease at the time of diagnosis were excluded from the study. All subjects were community dwelling. Twenty-four women were assigned to the experimental group and 26 were assigned to the control group.

Instruments

Demographics were obtained with the **Breast Cancer Treatment and Sociodemographic Data Tool**. The 32-item

Table 2. Descriptive Summary Statistics for Overall Quality of Life and Quality-of-Life Subscales

Category	Baseline (N = 50)		Three Months (N = 49)		Six Months (N = 48)	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Overall quality of life	2.38	1.02	2.48	1.20	2.58	1.33
Subscales						
Physical	1.29	0.80	1.52	1.02	1.59	1.06
Psychological	2.65	1.50	2.74	1.69	2.96	1.83
Social	2.18	1.29	2.11	1.31	2.19	1.43
Spiritual	3.62	1.54	3.82	1.67	3.59	1.68

tool includes items concerning sociodemographic characteristics (e.g., age, ethnicity, primary language, income, occupational status, religious affiliation) and treatment variables (Meneses et al., 2007). QOL was measured with the **Quality of Life-Breast Cancer (QOL-BC)** instrument (Ferrell, Dow, Leigh, et al., 1995), a 50-item scale that specifically measures QOL in women with breast cancer. The QOL-BC was adapted from the QOL-Cancer Survivors Scale (QOL-CS) (Ferrell, Dow, Leigh, et al.; Ferrell et al., 1996). The QOL-BC uses a 10-point rating scale to describe QOL issues or concerns within four identified QOL subscales: physical, psychological, social, and spiritual well-being (Ferrell, Dow, Leigh, et al.). Scoring is based on a scale of 0 (best outcomes) to 10 (worst outcomes); therefore, the lower the total score, the better the QOL. Reliability for the QOL-BC was established using the QOL-CS, which indicated a test-retest reliability of 0.89 and a Cronbach alpha of 0.93.

In the BCEI, alpha coefficients for total QOL and subscales were: overall QOL, 0.91; physical well-being, 0.99; psychological well-being, 0.96; social well-being, 0.84; and spiritual well-being, 0.85 (Meneses et al., 2007). In the current study, the alpha coefficients for total QOL and each QOL subscale were overall QOL, 0.80; physical well-being, 0.66; psychological well-being, 0.93; social well-being, 0.81; and spiritual well-being, 0.78.

Procedures

This study received university institutional review board approval. Written permission from the principal investigator of the BCEI research study was obtained. De-identified SPSS® 13.0 data files for subjects aged 65 years and older were received by the investigator. The files contained data collected at baseline (time 1), at three months (time 2), and at six months (time 3). Data were examined for accuracy, missing data, and outliers; inter-rater reliability was established prior to analysis with descriptive statistics (McNees, Meneses, & Brown, in press). No unexpected missing data were noted; however, two subjects did not complete the study. One withdrew prior to data collection at time 2 and another died prior to the final data collection (time 3) from causes unrelated to breast cancer or participation in the study. This resulted in complete data for 49 subjects at time 2 and 48 subjects at time 3.

Data Analysis

Descriptive statistics including frequencies, means, and standard deviations (SD) were used to address the primary aim and describe overall QOL and the four subscales. To get an overview of QOL in this sample, researchers combined QOL scores from both groups. Overall QOL for the entire sample was determined from the overall mean score of the combined subscales from the QOL-BC. Subscale scores were determined from the combined mean scores for all items within each subscale.

The Generalized Estimating Equation (GEE) method (Liang & Zeger, 1986; Zeger & Liang, 1992), which extends the quasi-likelihood approach (Wedderburn, 1974) to correlate longitudinal data, was used to address the secondary aim and evaluate the overall effect of the BCEI intervention. Without adjusting for covariates, GEE methods were used to examine the effects of the BCEI intervention using the outcome variables of overall QOL and the four QOL subscales. Two-sample and paired *t* tests were used to further analyze between-group differences and within-group longitudinal

changes. Bonferroni-type adjustments also were made. In the *t* tests, three inferences were made for each variable, bringing the significance level to 0.017.

Descriptive statistics and *t* tests were run using SPSS 13.0 software. GEE analysis was run using software developed in R (R Development Core Team, 2006).

Results

Sample Characteristics

This sample consisted of 50 older breast cancer survivors ranging in age from 65–83 years (\bar{X} = 72.1 years, *SD* = 5.12). The majority was Caucasian (82%) and reported English (92%) as their primary language. Forty-four percent of the sample reported an education level of college or higher. The majority was Christian of varying denominations (98%). Fifty-six percent were married and 80% were retired or unemployed, 8% worked full-time, and 12% worked part-time. Forty-four percent reported an annual family income of \$30,001 or more.

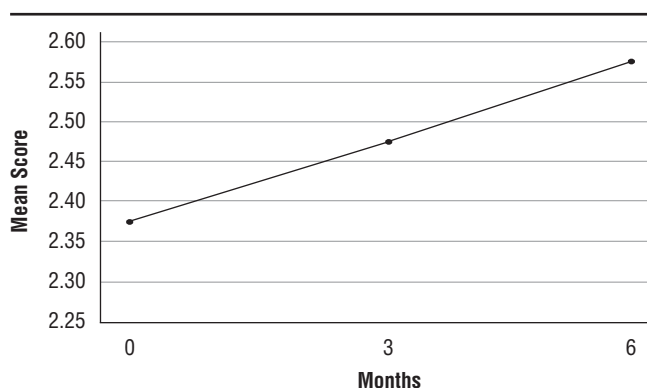
Seventy percent of the sample had stage I breast cancer and 30% had stage II. Seventy-two percent were treated with lumpectomy. Other treatments included chemotherapy (18%), radiation therapy (78%), and hormonal therapy (84%) (see Table 1). No statistically significant demographic or treatment-related differences were noted between the experimental and control groups.

Changes in Overall Quality of Life and the Quality-of-Life Subscales

At baseline, mean overall QOL was 2.38 (*SD* = 1.02), 2.48 (*SD* = 1.20) at time 2, and 2.58 (*SD* = 1.33) at time 3. Overall QOL was worse at time 2 and continued to worsen at time 3 (see Table 2). Figure 2 plots the mean overall QOL scores over time. Physical and psychological well-being declined from baseline to time 2 and time 3. Social well-being improved at time 2 but declined at time 3. Spiritual well-being declined at time 2, then improved at time 3 (see Figure 3).

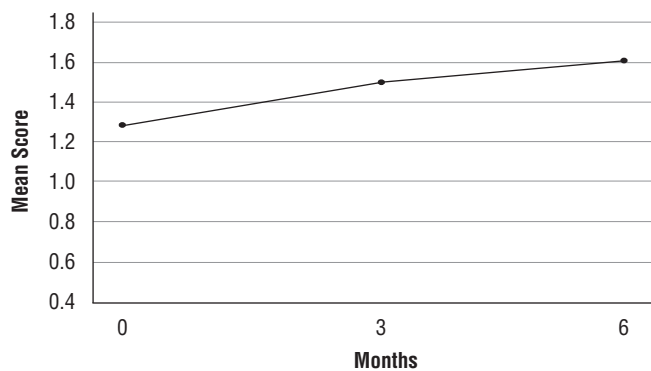
Effect of the Intervention on Quality-of-Life Outcomes

No significant differences existed in the mean scores for overall QOL between the experimental and control groups at

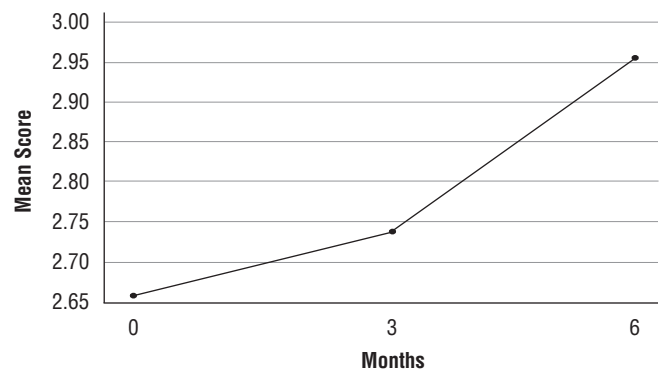


Note. The higher the score, the worse the quality of life.

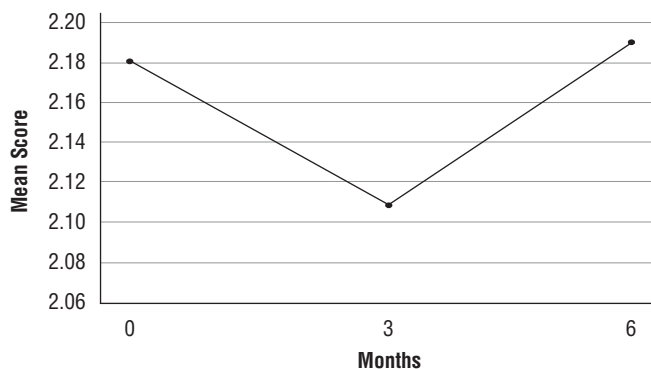
Figure 2. Plot of Means for Whole Group: Overall Quality of Life



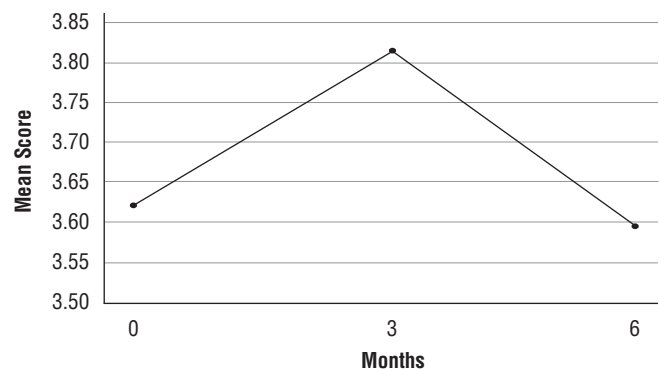
a. Physical Subscale



c. Psychological Subscale



b. Social Subscale



d. Spiritual Subscale

Note. The higher the score, the worse the quality of life.

Figure 3. Plot of Means for Whole Group: Quality-of-Life Subscales

baseline. In fact, no significant differences for overall QOL were found at any time point between the two groups. Table 3 shows the mean overall QOL scores for each group over time and the results of independent sample *t* tests for overall QOL. Figure 4 plots the changes in the mean overall QOL scores for each group over time.

No significant differences in the mean scores for the four QOL subscales existed between the experimental group and the control group at any time point. Figure 5 plots the mean changes in the four QOL subscales for the groups at each of the three time points.

GEE analysis found no treatment effect or intervention effect over time between the groups for overall QOL or physical, psychological, social, or spiritual well-being. Absolute robust *Z* scores ranged from 0.591–1.749, indicating no significant difference in intervention effects between the two groups (see Table 4).

Within-Group Differences and Changes in Quality-of-Life Outcomes

Within-group differences were noted for the experimental and control groups. Significant changes were noted in the experimental group from baseline to time 2 for physical well-being, indicating a worsening of physical well-being ($t[22] = -2.962, p = 0.007$). Physical well-being scores remained stable from time 2 to time 3. In addition, the following changes occurred but were not statistically significant: overall QOL declined slightly but steadily from baseline to

time 3; psychological well-being gradually worsened from baseline to time 3; social well-being improved at time 2, then declined slightly at time 3; and spiritual well-being declined from baseline to time 2 and slightly improved to above baseline scores at time 3.

Overall QOL steadily declined within the control group from baseline to time 3. Physical, psychological, and social well-being also declined from baseline to time 3. Spiritual well-being worsened from baseline to time 2, then improved from time 2 to time 3. None of these changes was statistically significant.

Discussion

Quality of Life in Older Women With Breast Cancer

When the researchers examined the entire sample, mean scores for overall QOL and the four QOL subscales reported by older women in the first year of survivorship after breast cancer indicated that older women reported generally good overall QOL and good physical, psychological, social, and spiritual well-being at baseline. However, QOL changes occurred over time. Declines in physical and psychological well-being may be related to noncancer-related experiences and events. The initial improvement in social well-being may be related to participation in the psychoeducational support intervention study where the women received individual attention. Therefore, the subsequent decline in social well-being may have been related to fewer contacts with subjects at the

Table 3. Between-Group Differences in Overall Quality of Life and Subscale Scores Using Independent T Tests

Category	Baseline			Three Months			Six Months		
	Control	Experimental	p	Control	Experimental	p	Control	Experimental	p
Overall quality of life			0.900			0.765			0.772
\bar{X}	2.42	2.45		2.60	2.50		2.63	2.53	
SD	1.06	0.75		1.28	0.90		1.44	0.95	
Physical			0.241			0.870			0.773
\bar{X}	1.41	1.15		1.50	1.55		1.60	1.54	
SD	0.94	0.60		1.11	0.94		1.17	0.95	
Psychological			0.967			0.856			0.729
\bar{X}	2.64	2.66		2.79	2.70		3.05	2.86	
SD	1.69	1.31		1.94	1.38		2.08	1.56	
Social			0.788			0.432			0.504
\bar{X}	2.14	2.24		2.26	1.96		2.32	2.04	
SD	1.40	1.18		1.49	1.06		1.72	1.07	
Spiritual			0.529			0.925			0.778
\bar{X}	3.48	3.76		3.84	3.80		3.53	3.66	
SD	1.45	1.65		1.62	1.75		1.68	1.72	

Note. Significance level was based on Bonferroni's adjustment, $p < 0.017$.

end of the study. Initial decline in spiritual well-being followed by improvement of spiritual well-being may be related to the QOL-BC survey.

Effects of the Breast Cancer Education Intervention on Older Women With Breast Cancer

Participants reported a decline in overall QOL over time. The sample size in this study was small; therefore, statistically significant differences between groups could not be established. However, this decline was noted to be less pronounced in the experimental group compared to the control group. The potential effect of the intervention in older women with early-stage breast cancer possibly lessened the decline in overall QOL (Meneses, McNees, & Su, 2008). The possibility that an intervention may lessen the decline of QOL in older breast cancer survivors after treatment is an important finding.

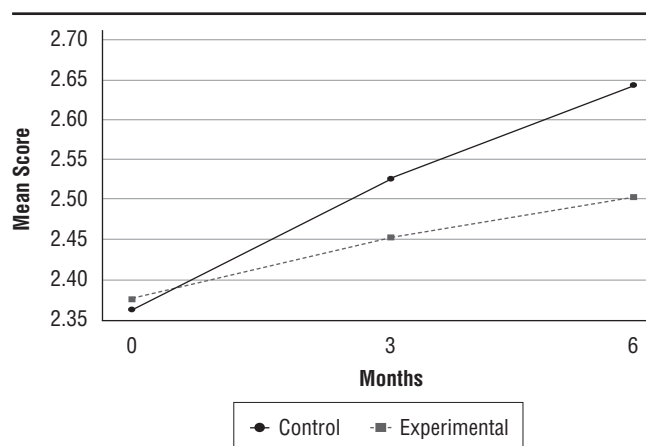
No significant differences were found between the groups at any time point within the four QOL subscales; however, it does appear that the patterns of change were different. Within the physical subscale, while well-being declined for both groups during the six months of the study, QOL initially declined more sharply for the experimental group compared to the control group. The decline may be linked to participation in the intervention, which may have alerted subjects to physical issues related to breast cancer that they previously attributed to some other cause. This new way of thinking about their symptoms may have prompted older women to report worsened physical symptoms related to their cancer at time 2. Well-being also declined within the psychological subscale, with the decline more notable in the control group. Subjects in the experimental group may have been experiencing a psychological benefit directly related to their participation in the intervention. Well-being appeared to improve in the social subscale for the experimental group at time 2, perhaps because the experimental group received immediate benefits from the personalized attention they received during the intervention. The control group reported a steady decline in social

well-being over time. The groups reported initial declines concerning the spiritual subscale; however, the decline was more pronounced in the control group.

Although study results did not detect a significant intervention effect between the experimental and control groups, an attenuation in the decline of overall QOL was reported by the experimental group. Although the goal of intervention research is to improve a situation, researchers should consider the possibility of attenuating decline in QOL in older women as positive. This study sets the stage for future research to use larger samples and observe subjects over longer periods of time to examine possible statistically significant differences and intervention effects in older breast cancer survivors.

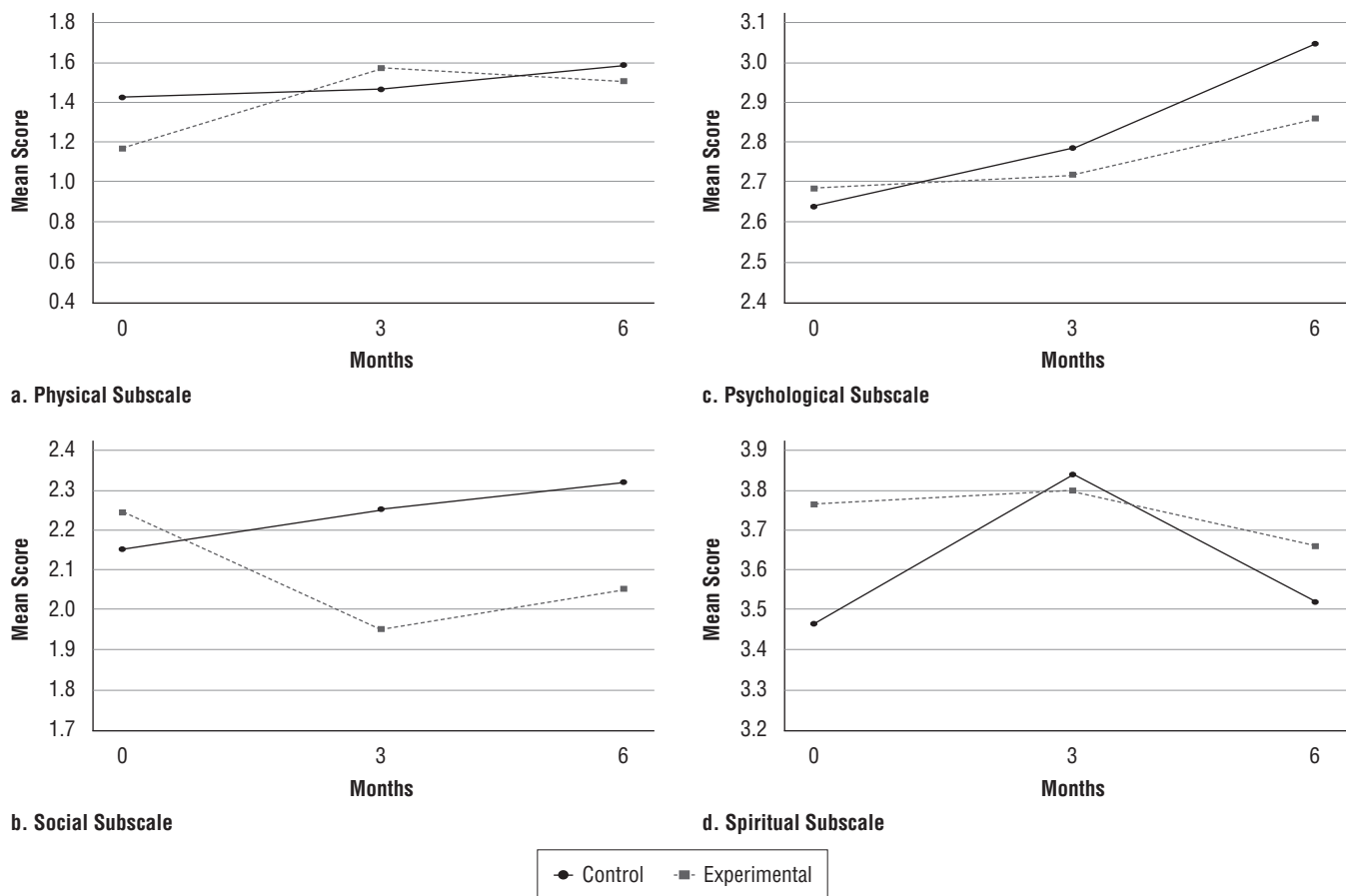
Limitations

Limitations exist within the QOL-BC measurement tool. Although the QOL-BC has been applied to various age groups



Note. The higher the score, the worse the quality of life.

Figure 4. Plot of Means for Overall Quality of Life for Control and Experimental Groups



Note. The higher the score, the worse the quality of life.

Figure 5. Plot of Mean Scores for Control and Experimental Groups for Quality-of-Life Subscales

of women with breast cancer, the components of each subscale may not adequately represent concerns of older breast cancer survivors during survivorship. Although the QOL-BC tool had acceptable alpha levels in this sample, they were comparatively lower than in the parent BCEI study. The alpha co-efficient for the physical subscale was considerably lower than levels reported in other studies. Subscales such as physical function that are reported in other studies (Fehlauer et al., 2005; Kroenke et al., 2004; Satiriano et al., 1989) are not represented in the QOL-BC tool and could not be directly measured for this sample. Finally, concerns about fertility and menstrual changes reported in younger women did not apply (Ferrell et al., 1996).

Another limitation found with the QOL-BC tool is that some items were nondirectional. For example, questions such as, "How much has your spiritual life changed as a result of your diagnosis?" and, "Has your illness or treatment caused changes in your self-concept (the way you see yourself)?" are nondirectional and difficult to interpret. Rewording these items in future studies of older breast cancer survivors may make responses easier to interpret. Although the QOL-BC survey has provided valuable information concerning older women with breast cancer, it requires additional use in older samples to determine reliability. In addition, instruments specific to older breast cancer survivors are needed.

Implications for Research and Practice

Few studies specifically focus on older breast cancer survivors; consequently, healthcare professionals have little understanding of the similarities and differences between older survivors and their younger counterparts. This void must be addressed if healthcare professionals are to ensure support that is specifically tailored to older survivors. Several areas of research study are warranted for the future. Additional areas include determining the extent of symptoms and their degree of distress in older breast cancer survivors and on specific concerns within each QOL subscale that may have an additional effect on QOL among older breast cancer survivors. Studies to better understand the experiences that may contribute to decline in QOL for older women during their first year of survivorship are needed, as are studies with larger sample sizes that observe subjects over longer periods of time to develop a more accurate account of the natural progression of QOL after treatment in older breast cancer survivors. Outcomes of such studies may lead healthcare professionals to develop interventions specifically tailored to the needs of older breast cancer survivors.

Nurses can use the findings in practice to examine whether gradual declines occur over time among their own patients. Nurses also may consider the education and support they

Table 4. Generalized Estimating Equation Comparisons Between Groups: Overall Quality of Life and Quality-of-Life Subscales

Category	Robust Z Score	Two-Sided p
Overall quality of life	−0.516	0.6059
Subscales		
Physical	1.749	0.0803
Psychological	−0.601	0.5478
Social	−1.613	0.1067
Spiritual	−0.591	0.5545

Note. Effects of treatment are not considered significant if the absolute robust Z score is < 2.0.

provide for their patients. Older breast cancer survivors may have different education and support needs after treatment, and nurses may consider tailoring their teaching to the needs

and styles of older breast cancer survivors rather than providing generic information to their patients.

Conclusions

The findings of this study add to the body of knowledge concerning older breast cancer survivors in the first year of survivorship. A vital finding showed that the BCEI attenuated the decline of QOL in the experimental group compared to the control group. The findings of this pilot study can serve as the basis for future intervention studies targeting the needs of older women.

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References

- American Cancer Society. (2007). *Breast cancer facts and figures: 2007–2008*. Retrieved September 30, 2008, from <http://www.cancer.org/downloads/STT/CAFF2005BrF.pdf>
- American Cancer Society. (2008). *Cancer facts and figures 2008*. Retrieved September 30, 2008, from http://www.cancer.org/docroot/STT/content/stt_1x_cancer_facts_figures_2008.asp
- Boyle, D.A. (2006). Survivorship. In R.M. Carroll-Johnson, L.M. Gorman, & N.J. Bush (Eds.), *Psychosocial nursing care along the cancer continuum* (pp. 25–51). Pittsburgh, PA: Oncology Nursing Society.
- Cameron, S., & Horsburgh, M.E. (1998). Comparing issues faced by younger and older women with breast cancer. *Canadian Oncology Nursing Journal*, 8(1), 40–44.
- Chagpar, A.B., Studts, J.L., Scoggins, C.R., Martin, R.C., Carlson, D.J., Laidley, A.L., et al. (2006). Factors associated with surgical options for breast carcinoma. *Cancer*, 106(7), 1462–1466.
- Cimprich, B. (1998). Age and extent of surgery affect attention in women treated for breast cancer. *Research in Nursing and Health*, 21(3), 229–238.
- Cimprich, B., & Ronis, D.L. (2001). Attention and symptom distress in women with and without breast cancer. *Nursing Research*, 50(2), 86–94.
- Cimprich, B., Ronis, D.L., & Martinez-Ramos, G. (2002). Age at diagnosis and quality of life in breast cancer survivors. *Cancer Practice*, 10(2), 85–93.
- de Haes, J.C., Curran, D., Aaronson, N.K., & Fentiman, I.S. (2003). Quality of life in breast cancer patients aged over 70 years, participating in the EORTC 10850 randomised clinical trial. *European Journal of Cancer*, 39(7), 945–951.
- Dow, K.H. (1991). The growing phenomenon of cancer survivorship. *Journal of Professional Nursing*, 7(1), 54–60.
- Dow, K.H. (2003). Seventh National Conference on Cancer Nursing Research keynote address: Challenges and opportunities in cancer survivorship research. *Oncology Nursing Forum*, 30(3), 455–469.
- Dow, K.H., Ferrell, B.R., Haberman, M.R., & Eaton, L. (1999). The meaning of quality of life in cancer survivorship. *Oncology Nursing Forum*, 26(3), 519–528.
- Dow, K.H., & Loerzel, V.W. (2005). Cancer survivorship: A critical aspect of care. In C.H. Yarboro, M.H. Frogge, & M. Goodman (Eds.), *Cancer nursing: Principles and practice* (6th ed., pp. 1665–1675). Sudbury, MA: Jones and Bartlett.
- Du, X.L., Jones, D.V., & Zhang, D. (2005). Effectiveness of adjuvant chemotherapy for node-positive operable breast cancer in older women. *Journal of Gerontology*, 60(9), 1137–1144.
- Feher, S., & Maly, R.C. (1999). Coping with breast cancer in later life: The role of religious faith. *Psycho-Oncology*, 8(5), 408–416.
- Fehlauer, F., Tribius, S., Mehnert, A., & Rades, D. (2005). Health-related quality of life in long-term breast cancer survivors treated with breast conserving therapy: Impact of age at therapy. *Breast Cancer Research and Treatment*, 92(3), 217–222.
- Ferrell, B.R., Dow, K.H., & Grant, M. (1995). Measurement of the quality of life in cancer survivors. *Quality of Life Research*, 4(6), 523–531.
- Ferrell, B.R., Dow, K.H., Leigh, S., Ly, J., & Gulasekaram, P. (1995). Quality of life in long-term cancer survivors. *Oncology Nursing Forum*, 22(6), 915–922.
- Ferrell, B.R., Grant, M., Funk, B., Garcia, N., Otis-Green, S., & Schaffner, M.L. (1996). Quality of life in breast cancer. *Cancer Practice*, 4(6), 331–340.
- Ferrell, B.R., Grant, M., Funk, B., Otis-Green, S., & Garcia, N. (1997). Quality of life in breast cancer. Part I: Physical and social well-being. *Cancer Nursing*, 20(6), 398–408.
- Ferrell, B.R., Grant, M., Funk, B., Otis-Green, S., & Garcia, N. (1998). Quality of life in breast cancer. Part II: Psychological and spiritual well-being. *Cancer Nursing*, 21(1), 1–9.
- Figueiredo, M.I., Cullen, J., Hwang, Y.T., Rowland, J.H., & Mandelblatt, J.S. (2004). Breast cancer treatment in older women: Does getting what you want improve your long-term body image and mental health? *Journal of Clinical Oncology*, 22(19), 4002–4009.
- Heidrich, S.M. (1996). Mechanisms related to psychological well-being in older women with chronic illnesses: Age and disease comparisons. *Research in Nursing and Health*, 19(3), 225–235.
- Heidrich, S.M., Egan, J.J., Hengudomsb, P., & Randolph, S.M. (2006). Symptoms, symptom beliefs, and quality of life of older breast cancer survivors: A comparative study. *Oncology Nursing Forum*, 33(2), 315–322.
- Holmberg, S.K., Scott, L.L., Alexy, W., & Fife, B.L. (2001). Relationship issues of women with breast cancer. *Cancer Nursing*, 24(1), 53–60.
- Kroenke, C.H., Rosner, B., Chen, W.Y., Kawachi, I., Colditz, G.A., & Holmes, M.D. (2004). Functional impact of breast cancer by age at diagnosis. *Journal of Clinical Oncology*, 22(10), 1849–1856.
- Leonard, R.C., & Malinovsky, K.M. (2005). Chemotherapy for older women with early breast cancer. *Clinical Oncology*, 17(4), 244–248.
- Liang, K.Y., & Zeger, S.L. (1986). Longitudinal data analysis using generalized linear models. *Biometrika*, 73, 13–22.
- Loescher, L.J., Welch-McCaffrey, D., Leigh, S.A., Hoffman, B., & Meyskens, F.L. (1989). Surviving adult cancers. Part I: Physiologic effects. *Annals of Internal Medicine*, 111(5), 411–432.
- Mandelblatt, J.S., Edge, S.B., Meropol, N.J., Senie, R., Tsangaris, T., Grey, L., et al. (2002). Sequelae of axillary lymph node dissection in older women with stage I and II breast carcinoma. *Cancer*, 95(12), 2445–2454.
- Mandelblatt, J.S., Edge, S.B., Meropol, N.J., Senie, R., Tsangaris, T., Grey, L., et al. (2003). Predictors of long-term outcomes in older breast cancer

- survivors: Perceptions versus patterns of care. *Journal of Clinical Oncology*, 21(5), 855–863.
- Manning-Walsh, J.K. (2005). Psychospiritual well-being and symptom distress in women with breast cancer. *Oncology Nursing Forum*, 32(3), 543.
- McNees, P., Meneses, K., & Brown, J. (in press). Incrementally improving data integrity: Applying engineering quality control techniques in a longitudinal breast cancer clinical trial. *Nursing Research*.
- Meneses, K., McNees, P., Loerzel, V.W., Su, X., Zhang, Y., & Hassey, L. (2007). Transition from treatment to survivorship: Effects of a psychoeducational intervention on quality of life in breast cancer survivors. *Oncology Nursing Forum*, 34(4), 1007–1016.
- Meneses, K., McNees, P., & Su, X. (2008). Differential effects of a psychoeducational support intervention on quality of life between older and younger breast cancer survivors in the first year of post treatment survivorship. Unpublished manuscript.
- Muss, H.B., Woolf, S., Berry, D., Cirincione, C., Weiss, R.B., Budman, D., et al. (2005). Adjuvant chemotherapy in older and younger women with lymph node-positive breast cancer. *JAMA*, 293(9), 1073–1081.
- Padilla, G.V., Ferrell, B., Grant, M.M., & Rhiner, M. (1990). Defining the content domain of quality of life for cancer patients with pain. *Cancer Nursing*, 13(2), 108–115.
- Pinto, B.M., & Trunzo, J.J. (2004). Body esteem and mood among breast cancer survivors. *Mayo Clinic Proceedings*, 79(2), 181–186.
- R Development Core Team. (2006). A language and environment for statistical computing—The reference index [v.2.3.1]. Retrieved September 30, 2008, from <http://cran.r-project.org>
- Rustoen, T., Moum, T., Wiklund, I., & Hanestad, B.R. (1999). Quality of life in newly diagnosed cancer patients. *Journal of Advanced Nursing*, 29(2), 490–498.
- Satariano, W.A., Ragheb, N.E., Buck, K.A., Swanson, G.M., & Branch, L.G. (1989). Aging and breast cancer: A case-control comparison of instrumental functioning. *Journal of Aging and Health*, 1(2), 209–233.
- U.S. Census Bureau. (2005). 65+ in the United States: 2005. Retrieved September 23, 2008, from <http://www.census.gov/prod/2006pubs/p23-209.pdf>
- Utley, R. (1999). The evolving meaning of cancer for long-term survivors of breast cancer. *Oncology Nursing Forum*, 26(9), 1519–1523.
- Wang, X., Cosby, L.G., Harris, M.G., & Liu, T. (1999). Major concerns and needs of breast cancer patients. *Cancer Nursing*, 22(2), 157–163.
- Wedderburn, R.W.M. (1974). Quasi-likelihood functions, generalized linear models, and the Gauss-Newton method. *Biometrika*, 72, 31–38.
- Welch-McCaffrey, D., Hoffman, B., Leigh, S.A., Loescher, L.J., & Meyskens, F.L. (1989). Surviving adult cancers. Part 2: Psychosocial implications. *Annals of Internal Medicine*, 111(6), 517–524.
- Wenzel, L.B., Fairclough, D.L., Brady, M.J., Cella, D., Garrett, K.M., Kluhsman, B.C., et al. (1999). Age-related differences in the quality of life of breast carcinoma patients after treatment. *Cancer*, 86(9), 1768–1774.
- World Health Organization. (1993). Study protocol for the World Health Organization project to develop a quality-of-life assessment instrument (whoqol). *Quality of Life Research*, 2(2), 153–159.
- Yancik, R., & Ries, L.A. (2000). Aging and cancer in America: Demographic and epidemiologic perspectives. *Hematology Oncology Clinics of North America*, 14(1), 17–23.
- Zebrack, B.J. (2000). Cancer survivor identity and quality of life. *Cancer Practice*, 8(5), 238–242.
- Zeger, S.L., & Liang, K.Y. (1992). An overview of methods for the analysis of longitudinal data. *Statistics in Medicine*, 11(14–15), 1825–1839.